

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. In a communications network, having at least two devices adapted to communicate an instruction between the devices,
5 a front interface provided on one computer, and a substantially corresponding back interface provided on the other computer,
the improvement comprising:
selection means for selecting the encoding, for encoding the instruction, from a set of one or more available encodings.
- 10 2. A selection means as claimed in claim 1, wherein a stub is adapted to encode the instruction and a respective skeleton is adapted to decoding the instruction.
- 15 3. A selection means as claimed in claim 1 or 2, wherein the set of available encodings includes a stream based communication.
4. A selection means as claimed in claim 1, 2 or 3, wherein the set of available encodings includes a virtual computer based communication.
- 20 5. A selection means as claimed in any one of claims 1 to 4, wherein the set of available encodings includes a message based communication.
6. A selection means as claimed in claim 4, wherein the virtual computer is a
25 computer as claimed in any one of claims 11 to 14.
7. A communications and/or computer network including the selection means as claimed in any one of claims 1 to 6.
- 30 8. A method of communicating an instruction from a first device to a second device, the first device having a first interface and the second device having a second interface, the method comprising the steps of:
selecting a communication protocol from a set of available communication protocols,

encoding the instruction in accordance with the selected protocol, and transmitting the encoded instruction from the first device to a second device.

- 5 9. A method as claimed in claim 8, further comprising the steps of:
receiving the encoded instruction by the second device,
selecting a corresponding decoding protocol from an available set of
communication protocols, and
10 decoding the instruction in accordance with the selected decoding
protocol.

10. A method as claimed in claim 8 or 9, wherein at least one of the set of available protocols includes at least one of a message based protocol, a stream based protocol and/or a virtual computer.

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11. A virtual computer, comprising:
an object stack and/or an object heap, each of the stack and heap being
adapted to store at least one object and its corresponding type identifier, and
an instruction set having at least one instruction adapted for execution by
20 the virtual computer.

12. A virtual computer as claimed in claim 11, further comprising:
a state register being adapted to provide at least one operating register.

- 25 13. A virtual computer as claimed in claim 11 or 12, wherein the stack enables a user to specify how each object placed on the stack is to be serialised.

14. A virtual computer as claimed in claim 11, 12 or 13, wherein an external identifier is recorded with an object as the object is placed on the heap.

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15. A method of executing an instruction set using a virtual computer, in a communications network having at least two devices, the method comprising the steps of:
serialising the virtual computer to a data buffer in a first device, and

transmitting the data buffer to from the first device to a second device.

16. A method as claimed in claim 15, further comprising:
receiving the serialised data buffer,
5 un-serialising the data buffer, and
executing at least one instruction of the virtual computer.
17. A method as claimed in claim 15 or 16, wherein the method is repeated to
transmit the virtual computer to a further device.
- 10 18. A method as claimed in claim 15, 16 or 17, wherein the virtual computer is
a computer as claimed in any one of claims 11 to 14.
19. A communications format for use in providing communication between at
15 least two devices, the format comprising:
a first portion representing data, the first portion being adapted to be
rendered and communicated in an electronically communicable format, such as
binary format, and
a second portion representing metadata for defining a meaning to be given
20 to the first portion, the meaning given to the second portion being definable for
each communication.
20. A format as claimed in claim 19, wherein the second portion is adapted to
be rendered and communicated in an electronically communicable format, such
25 as binary format.
21. A format as claimed in claim 19 or 20, wherein the definition given to the
second portion is selectable from a set of at least one definitions.
- 30 22. A format as claimed in claim 19 or 20, wherein the first and second
portions are communicated in separate transmissions.
23. A format as claimed in claimed in claim 19, wherein the second portion
represents a selection of at least one meaning to be given to the first portion.

24. A format as claimed in claim 23, wherein the meaning to be given to the first portion is stored in at least one of the two devices.
25. A communications format as claimed in any one of claims 19 to 24,
5 wherein the second portion further provides information on reading the data.
26. A format as claimed in any one of claims 19 to 25, wherein the second portion is a tag(s).
- 10 27. A format as claimed in claim 26, wherein the tag(s) is an element of a map providing correlation to stored information defining the second portion.
28. A format as claimed in claim 27, wherein the map is adapted to map an external identifier to an internal identifier.
- 15 29. A format as claimed in any one of claims 19 to 28, wherein the metadata is serializable for communication between the devices.
30. A format as claimed in any one of claims 19 to 29, wherein the metadata
20 comprises metadata.
31. A format as claimed in any one of claims 19 to 29, wherein the format only describes the data.
- 25 32. A method of communicating between at least two devices, the method comprising the steps of:
providing a first portion representing data, the first portion being adapted to be rendered and communicated in an electronically communicable format, such as binary format, and
30 providing a second portion representing metadata for defining a meaning to be given to the first portion, the meaning given to the second portion being definable for each communication.

33. A method as claimed in claim 32, wherein the second portion is adapted to be rendered and communicated in an electronically communicable format, such as binary format.
- 5 34. A method as claimed in claim 32 or 33, wherein the definition given to the second portion is selectable from a set of at least one definitions.
35. A method as claimed in claim 32 or 33, wherein the first and second portions are communicated in separate transmissions.
- 10 36. A method as claimed in claimed in claim 32, wherein the second portion represents a selection of at least one meaning to be given to the first portion.
37. A method as claimed in claim 36, wherein the meaning to be given to the
15 first portion is stored in at least one of the two devices.
38. A method as claimed in any one of claims 32 to 37, wherein the second portion further provides information on reading the data.
- 20 39. A method as claimed in any one of claims 32 to 38, wherein the second portion is a tag(s).
40. A method as claimed in claim 39, wherein the tag(s) is a map providing correlation to stored information defining the second portion.
- 25 41. A method as claimed in claim 40, wherein the map is adapted to map an external identifier to an internal identifier.
42. A method as claimed in any one of claims 32 to 41, wherein the metadata
30 is serializable for communication between the devices.
43. A method as claimed in any one of claims 32 to 42, wherein the metadata comprises metadata.

44. A method as claimed in any one of claims 32 to 42, wherein the format only describes the data.
45. An architecture for a communication device, the architecture comprising:
5 a programming layer for communications internal to the device,
a communications layer for communications external to the device,
wherein
the external communications are in accordance with the format as claimed
in any one of claims 19 to 31.
- 10 46. An architecture for a communication device, the architecture comprising:
a programming layer for communications internal to the device,
a communications layer for communications external to the device,
wherein
15 the external communications are in accordance with the selection means
as claimed in any one of claims 1 to 6.
47. An architecture for a communication device, the architecture comprising:
20 a programming layer for communications internal to the device,
a communications layer for communications external to the device,
wherein
the external communications include a virtual computer as claimed in any
one of claims 19 to 24.
- 25 48. Apparatus adapted to provide communications from a first device to a
second device, said apparatus including:
processor means adapted to operate in accordance with a predetermined
instruction set,
said apparatus, in conjunction with said instruction set, being adapted to
30 perform the method as claimed in any one of claims 8 to 10 or 32 to 44.

49. Apparatus adapted to execute an instruction set using a virtual computer, said apparatus including:

processor means adapted to operate in accordance with a predetermined instruction set,

5 said apparatus, in conjunction with said instruction set, being adapted to perform the method as claimed in any one of claims 15 to 18.

50. Apparatus adapted to communicate via a format as claimed in any one of claims 19 to 31, said apparatus including:

10 processor means adapted to operate in accordance with a predetermined instruction set,

said apparatus, in conjunction with said instruction set, being adapted to perform the communication.

15 51. A computer program product including:

a computer usable medium having computer readable program code and computer readable system code embodied on said medium for providing communications from a first device to a second device within a computer system, said computer program product including:

20 computer readable code within said computer usable medium for performing the method according to any one of claims 8 to 10 or 32 to 44.

52. A computer program product including:

25 a computer usable medium having computer readable program code and computer readable system code embodied on said medium for executing an instruction set using a virtual computer within a computer system, said computer program product including:

computer readable code within said computer usable medium for performing the method according to any one of claims 15 to 18.

53. A computer program product including:
a computer usable medium having computer readable program code and
computer readable system code embodied on said medium for providing
communications within a computer system, said computer program product
5 including:
computer readable code within said computer usable medium being
adapted to communicate via a format as claimed in any one of claims 19 to 31.
54. A device, selection means, network substantially as herein disclosed with
10 reference to the accompanying drawings.
55. A method substantially as herein disclosed with reference to the
accompanying drawings.